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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,218	02/03/2004	Anatoliy Savchenkov	06618/928001	2201
20985	7590	11/17/2005	EXAMINER	
FISH & RICHARDSON, PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			LEE, JOHN D	
			ART UNIT	PAPER NUMBER
			2874	

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No. 10/772,218	Applicant(s) SAVCHENKOV ET AL.	
	Examiner John D. Lee	Art Unit 2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17-32 is/are allowed.
- 6) ☒ Claim(s) 1-6, 9-16 is/are rejected.
- 7) ☒ Claim(s) 7-8 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>0305,0505</u> . | 6) <input type="checkbox"/> Other: ____. |

The six (6) sheets of drawings filed in this application on February 24, 2005, are acceptable.

The disclosure has not been studied to the extent necessary to discover all possible minor errors therein. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The preliminary amendment filed on December 10, 2004, has been entered.

Claims 4 and 8 are objected to because of the following minor informalities. In claim 4, line 1, "s" should be "as"; and in claim 8, line 2, "a" should be "an". Appropriate correction is required.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-6, 10, 12-14, and 16 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by PCT International Publication Number WO 01/96936 A1 to Maleki et al (submitted by applicant). Maleki et al discloses an apparatus and method for filtering an optical signal by employing an optical resonator configured to support whispering gallery modes and comprising a portion where the whispering gallery modes are present, and wherein at least the portion of the optical resonator can exhibit an electro-optical effect to change a refractive index in response to an applied electric field. In the Maleki et al reference, an optical signal from light source **120** is directed into the optical resonator **101** by evanescent optical coupler **110**, and an electrical control signal **132** is applied to at least the portion of the optical resonator by electrical coupler **130** to

directly modulate optical absorption (or refractive index) in the resonator **101** and thus tune the output spectrum of the resonator. The output optical signal is outputted by means of evanescent optical coupler **110**. As indicated on pages 9 and 10 of Maleki et al, the optical resonator may be formed from at least a portion of a whole dielectric sphere that includes the equator of the sphere; or a portion of the sphere near the equator that is sufficiently large to support the whispering gallery modes such as rings and disks; or an oblate spheroidal microcavity or microtorus. The electrical coupler **130** can be in the form of an electrode formed on the optical resonator **101** (pages 12-13 of Maleki et al). The evanescent coupler **110** can be implemented using optical fibers or waveguides or microprisms (page 12 of Maleki et al).

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 9, 11, and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over PCT International Publication Number WO 01/96936 A1 to Maleki et al (submitted by applicant). Maleki et al does not explicitly disclose the use of TM or TE modes in whispering gallery modes when coupling the optical signals into and out of the optical resonator. This would imply that polarization is not an issue in the reference, so that the use of TM modes, or TE modes, or both, would have been obvious to the person of ordinary skill. Although Maleki et al does not explicitly disclose that the optical resonator can be a lithium niobate crystal, the reference does disclose that the resonator can be a dielectric crystal having electro-optic properties. Since lithium niobate is

perhaps the best known and most widely used of such crystals, the person of ordinary skill in the art would have found its use in Maleki et al to have been obvious. Similarly, Maleki et al does not disclose that the optical evanescent coupler could be a photonic gap material. Since the possibilities for the evanescent coupler set forth on page 12 of the reference does not seem to be exhaustive, the use of a photonic gap material for such coupler would have been obvious.

Claims 7 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The very specific method steps set forth in claims 7 and 8 are not disclosed or suggested by Maleki et al.


Claims 17-32 are allowed. The additional structural elements and method steps set forth in these claims describe a device and method which are very specific in nature, and which are neither disclosed nor reasonably suggested by Malecki et al.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Other optically resonant filtering devices and methods which support whispering gallery modes can be seen in the cited U.S. Patents to Vahala et al, Sercel et al '996, Sercel et al '997, and Savchenkov et al. These references, however, do not disclose or suggest electrical tuning of the resonator in the manner claimed by applicant.

All of the prior art documents cited by applicant in the Information Disclosure Statements filed on March 1, 2005, and May 27, 2005, including the Maleki et al document relied on in the rejections above, have been considered and made of record. Note the attached initialed copy of forms PTO-1449.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. § 103(c) and potential 35 U.S.C. §§ 102(e), (f) or (g) prior art under 35 U.S.C. § 103(a).

Any inquiry concerning the merits of this communication should be directed to Examiner John D. Lee at telephone number (571) 272-2351. The Examiner's normal work schedule is Tuesday through Friday, 6:30 AM to 5:00 PM. Any inquiry of a general or clerical nature (i.e. a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562, to the technical support staff supervisor (Team 8) at telephone number (571) 272-1564, or to the Technology Center 2800 Customer Service Office at telephone number (571) 272-1626.


John D. Lee
Primary Patent Examiner
Group Art Unit 2874